

Work Order ID 135115

Wednesday, July 29, 2015 3:14:36 PM

135115

Page 1

Item ID: D407-667-205 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Aft Crosstube - High 407
 Start Date: 7/29/2015 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 7/30/2015 Req'd Qty: 1.00 ***1*** Customer: CEDWA01
 Reference: RMA RA112099

Approvals: Process Plan: mf Date: 15-7-29 Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr								
D407-667-245	G								

100

0.00

100

QC

Quality Control

Memo

0.00

INSPECT RA 112099

D407-667-205 X 1 B112867

TRW B108607

CROSTUBE WAS RETURNED FOR EVALUATION

AFTER INSPECTION:

-HAS SOME CORROSION

-DAMAGE ON CHAFING STRIP

-DAMAGE ON CROSTUBE NEAR CHAFING STRIP

PERFORM REWORK AS PER RS1028

SHIP BACK TO CUSTOMER

110

0.00

110

Crosstubes

Crosstubes

Memo

0.00

DAS

41

9-89

15-12-9

D407-667-205 Repair / 135115

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : ☐					

Wednesday, July 29, 2015 3:14:36 PM

Page 2

Accept

Setup Start *NS1*

Stop *NS2*

Start Date: 7/29/2015 **Start Qty:** 1.00 ***1***

Cust Item ID:

Required Date: 7/30/2015 Req'd Qty: 1.00 *1*

Customer: CEDWA01

Reference: RMA RA112099

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Operation Description

Set Up/ Run Hours

Tool ID

Tool #**Plan
Code**

**Accept
Qty**

Reject
QtyReject
Number

**Insp.
Stamp**

120

QC5- Inspect part completeness to step on W/O

0,00

120

QC

Memo

0.00

Quality Control

FL 0918

130

QC21- Final Inspection - Work Order Release

0.00

130

QC

Memo

0.00

Quality Control

1

DEC 09 2015

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

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Date :	Step #:	QTY Effective :	MRB (QSI042) Approval
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		Lead hand / Supervisor Approval Verification
		QC / QA Coordinator Approval

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Picklist Print

Wednesday, July 29, 2015 3:14:35 PM

Page 1

Work Order ID: 135115

135115

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube - High 407

Start Date: 7/29/2015

Required Date: 7/30/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM
IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
JLM

CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER

IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified
by:EC

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I

10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev J 11.04.26

removed abrasion strip ecn 11-551 EC verified

by:DD

IPP REV:K

11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205		Manufactured	No				Each	0.0000		1			

D407-667-205

Aft Crosstube - High 407

1 x 112867

MF 15-7-29

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
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OTHER : ☐					

DART AEROSPACE LTD	Work Order:	
Description: Corrosion in center of cross tube		
Drawing: D407-667-245	Repair Scheme:	RS1028
Part No: D407-667-205 Aft Crosstube	Page:	1 of 2
Batch No: B112867	Qty:	1

Step	Location	Procedure	By	Date	Qty
1	Quality Assurance	Inspect Condition of RA 112099 D407-667-205 B112867 ALL WORK TO BE CARRIED OUT AS PER ICA - Removed from N402LW - Original removal tag attached to work order - No hardware returned with kit - D407-667-205 will be rework as per ICA-0206-667-1 Check the following POOR / USED ☐ DAMAGED / USED ☐ CORRODED / USED ☒ NEW ☐	DAS 9 9-89	15-08-05	
2	Finishing / Crosstube assembly	Remove the following hardware from tube - D2894-1 Support B113132 clean off all Scotch-Weld & clean support entirely and tag to be reinstalled on the cross tube - Discard all MS21920-25 M127823 x2 & D3595-063-450 B113323 x2 - MS21920-22 M128199 x4 and discard - Remove D3190-1 B105834 x2 and Discard	W	2015/08/05	
3	Finishing / Crosstube assembly	Strip center sections as instructed By QA Coordinator as per QSI005 (both paint & Primer must be removed) PO# 29714	W	2015/08/05	
4	QC 15 Quality Control	Measure all dimensions as per DWG / ICA & fill out on the crosstube dimension sheet	W	2015/08/05	
5	Landing Gear / Crosstube	<u>BUFF OUT ALL CORROSION AND MARKS WITHIN ACCEPTABLE LIMITS AS INSTRUCTED IN THE ICA</u>	W	2015/08/05	
6	Landing Gear / Crosstube	Perform ultrasonic measurements in the locations from the original work order D407-667-205TRN B108607 and at location where corrosion was found Fill out wall thickness measurement FAI	W	2015/08/05	
7	QC 5 Quality Control	Inspect work to current step	W	2015/08/05	
8	Finishing	Alodine as per QSI005 4.1	W	2015/08/05	
9	QC 7 Quality Control	Inspect alodine finish as per QSI 005 & QSI 012	W	2015/08/05	
10	Finishing / Crosstube Assembly	Prime as Per QSI 005 4.2 Tempo 4500-PB-23Y-BG B# <u>132384</u> Exp. Date # <u>8/16</u> <u>Clear 132664</u> <u>Paint 132896</u>	DAS 41 9-89	15-10-13	1

h2 23.4/
23375
TS = 92.1"
L 53.5°
53.9°

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval	
Description Work Order Deviation		Disposition			

Root Cause	FAULT CATEGORY		
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐
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OTHER : _____			

DART AEROSPACE LTD	Work Order:	
Description: Corrosion in center of cross tube		
Drawing: D407-667-245	Repair Scheme:	RS1028
Part No: D407-667-205 Aft Crosstube	Page:	2 of 2
Batch No: B112867	Qty:	1

11	QC 14 Quality Control	Inspect finish of tube	DAS 30 9-89	DEC 09 2015	1
12	Finishing / Crosstube assembly	Reinstall as per DWG Install Chafing Shield as per D407-667-245 rev G. Ensure that the overlapping edge of the chafing shield is located at approximately 60° from bottom vertical to prevent deterioration of the rubber bumpers. Be sure to eliminate any air gaps. D3190-1 x2 B# <u>132155</u> x1 / <u>133120</u> x1 MS21920-22 x4 M# <u>132854</u> A/R Proseal 890 B# <u>133071</u> Exp.: <u>2/16</u> Lightly Scuff the bonded are using 320 grit sand paper and clean area with 41058 was 'n' wipe. Install original D2894-1 using Scotch-Weld DP460 and install clamps as per DEO D407-667-245 using installation jig DT9025. Torque clamps as per Dwg A/R Scotch-Weld DP460 B# <u>132895</u> Exp.: <u>8/16</u> MS21920-25 x2 M# <u>133091</u> D3595-063-450 x2 B# <u>136574</u>		DAS 41 9-89 15-10-23	1
13	QC 5 Quality Control	Re-inspect locations for Installed hardware as per Dwg Re-inspect Torque of clamps to 80-100 IN-LB	DAS 30 9-89	DEC 09 2015	/
14	Stores / Packaging	Pick kit AN5-10A7 M# <u>133073</u> x10 AN5-34A M# <u>133363</u> x4 AN5-32A7 M# <u>133323</u> x4 MS21042L5 M# <u>133363</u> x4 NAS1149D0563J M# <u>130799</u> x18 ID 15-11-3 Had in new paper work And new label with identification as USED part	BAS 27 8-89	DEC 14 2015	J
15	QC 4 Quality Control	Inspect Kit for completeness and ensure labels are correct	DAS 28 8-89	DEC 14 2015	1
16	Packaging	Identify & Stock as USED <u>FG093</u>	DAS 28 9-89	DEC 14 2015	1
17	Quality Control	QC21			

Rev	Date	Change Description	Prepared	Checked	Approved
A	15.07.24	New Issue	PD		

U:\Admin\Forms\Repairschemb\A.doc

Rev. A

DQA: _____ Date: _____



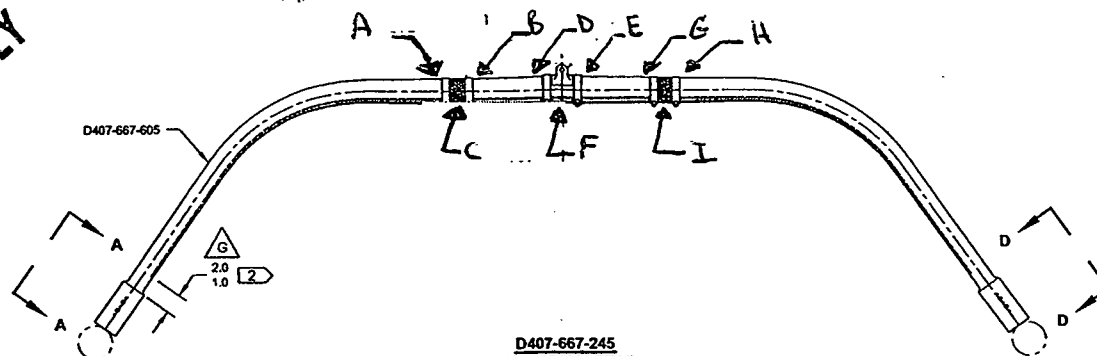
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

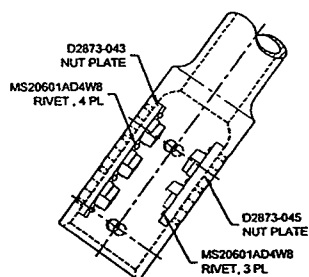
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				QC / QA Coordinator Approval																																																																	
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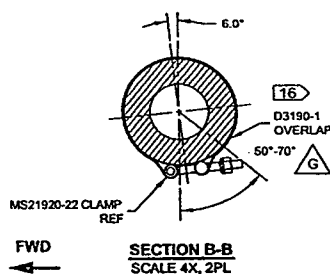
REFERENCE ONLY



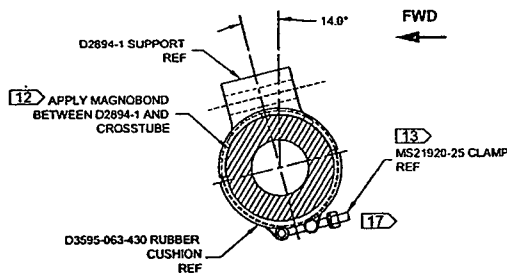
D407-667-245
ASSEMBLY DETAIL
(VIEW LOOKING FWD)



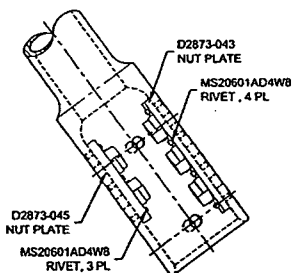
VIEW A-A CUFF DETAIL
SCALE 4X



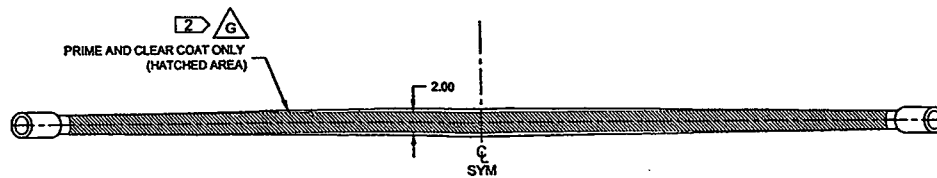
SECTION B-B
SCALE 4X, 2PL



SECTION C-C
SCALE 4X



VIEW D-D CUFF DETAIL
SCALE 4X



RELEASED
2015 APR 09

DESIGN	97	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. G
MFG. APPR.	97	D407-667-245	SHEET 2 OF 4
APPROVED	97	TITLE	SCALE
DE APPR.	97	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	15.03.20	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Location	Before dimension	After dimension	Accept	Reject	Methode of inspection
----------	------------------	-----------------	--------	--------	-----------------------

A					blade mic
B					blade mic
C					ultra sound
					ultra sound
					ultra sound
					ultra sound
D					blade mic
E					blade mic
F					ultra sound
					ultra sound
					ultra sound
					ultra sound
G					blade mic
H					blade mic
I					ultra sound
					ultra sound
					ultra sound
					ultra sound

measured by:
date:

inspected by:
date:

RA112099

Received @ July 15, 2015
Inspected@ July 23, 2015

CUSTOMER: BELL_CHEVRON
CUSTOMER CONTACT: ALAN LOUPE
SHIPPED FROM: PICAYUNE, MS USA

Instructions for RA112099 D407-667-205 B112867 CHG008

- 1x D407-667-205 was return for evaluation
- After visual inspection it was found that crosstube as some corrosion issue, damage on chafing strip and damage on crosstube near chafing strip. See attach picture
- Perform rework as per RS1028
- Ship back to customer

Time Estimate: Minimum 60 hours

Departments Required: Quality engineering finishing and crosstube

Pictures Attached: Yes

QTY INSPECTED: 1x D407-667-205 B112867 CHG008

**THIS INSTRUCTION SHEET
MUST BE ATTACHED TO THE
RESTOCKING WORK ORDER
AT ALL TIMES!!!!**

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

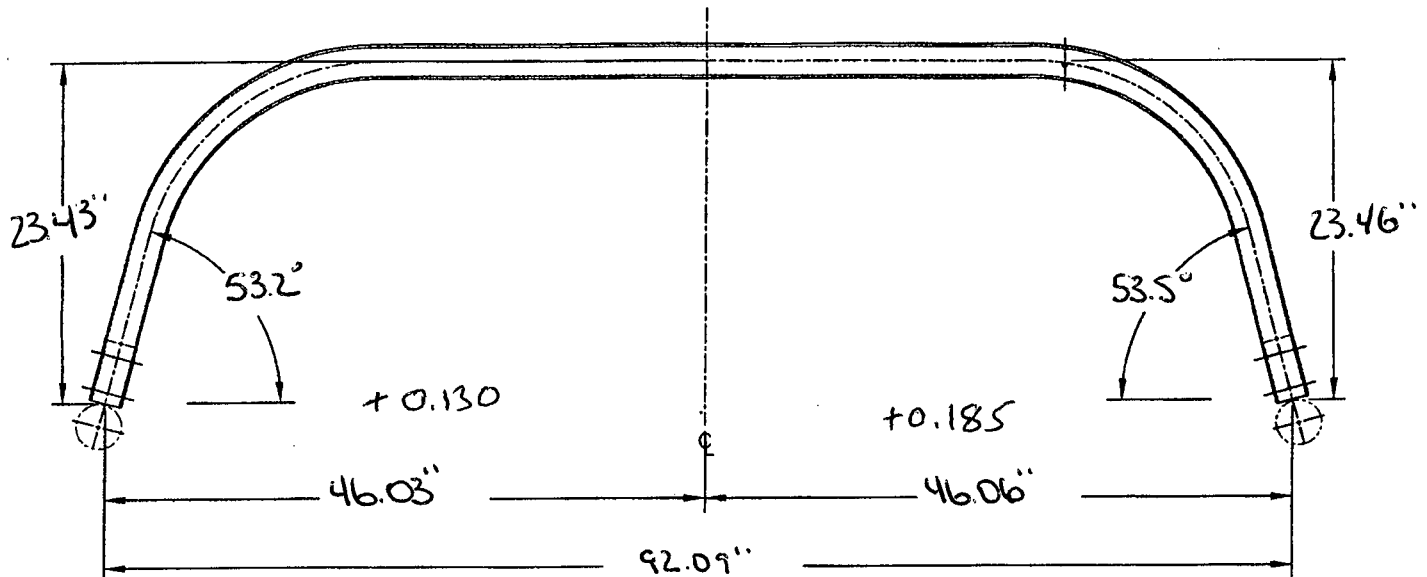
Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :				MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval	
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐		
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐		
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐		
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐		
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐		
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Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐		
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____					
Misidentified ☐	Past Due ☐						

DART AEROSPACE LTD		Work Order:	
Description: Crosstube High Aft (407)		Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: G			Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100
Bending Passes	6	--
Crushing	--	6%



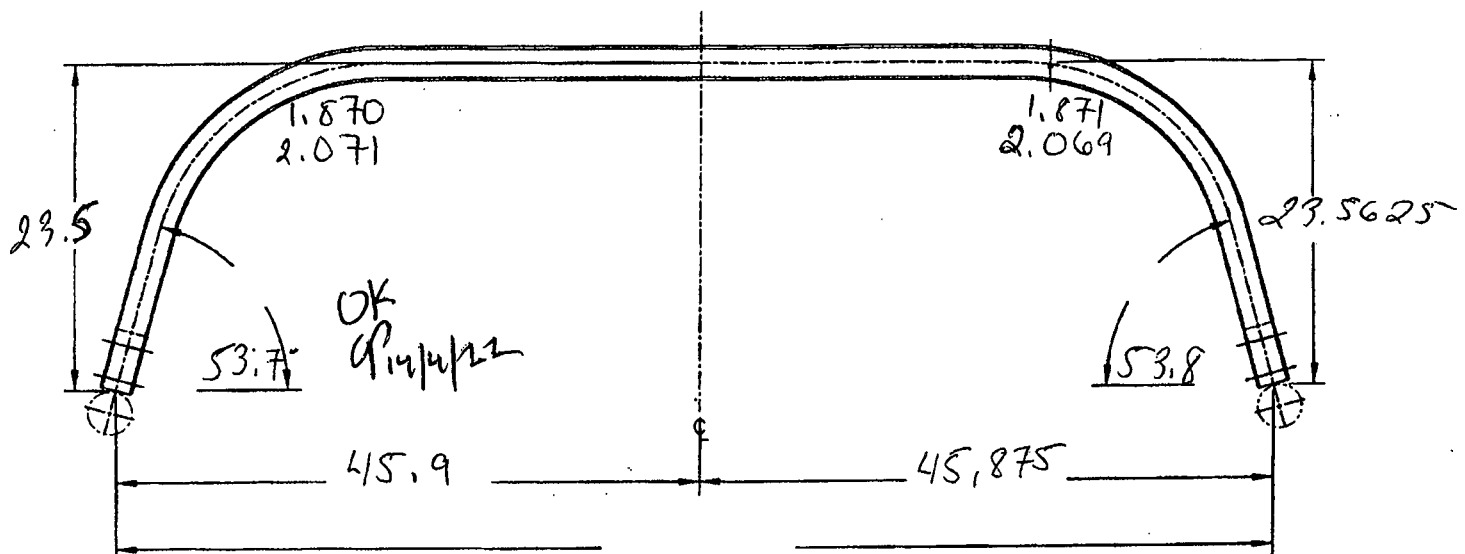
	Side A	Side B
Bending Passes		
Crushing		
Comments		
- FAI for use crosstube RA112099		
- Original FAI attach.		
Measurement are all within ICA limits.		

QC15 Inspection	DAS
Date	9-89

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	
E	12.04.16	Added bending, crushing dimensions	KJ	
F	15.05.14	Dwg Rev updated	KJ	

DART AEROSPACE LTD	Work Order:	112862
Description: Crosstube High Aft (407)	Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	28	28
Crushing	5.11	5.1
Comments		

QC15 Inspection	DAS
Date	03 9-89
	14-4-22

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	
E	12.04.16	Added bending, crushing dimensions	KJ	



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO29714

Purchase Order Date 9/8/2015

PO Print Date 9/8/2015

Page Number 1 of 2

Order From :

VC-IMI001

Ship To : DART AEROSPACE LTD

IMI MANUFACTURING INC.
772 MAIN ST. E.P.O. BOX 3
HAWKESBURY, ON K6A 2R4
CA

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

FAKED

Contact Name

Vendor Phone

613 675 1208 Ext.223

Ship To Contact

Ship To Phone

Ship Via:

Ship Acct:

Buyer

Customer POID

Customer Tax #

Terms

Currency

FOB

Chantal Lavoie

10127-2607

Net 30

CAD

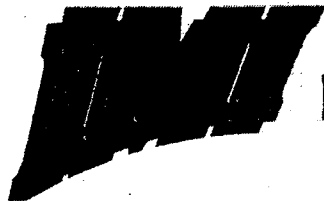
Destination-Collect

Line Nbr	Reference Vendor Part Number Line Comments Delivery Comments	Description/ Mfg ID	Req Date/ Taxable Promise Date	CD	Req Qty/ Unit of Measure	PO Unit Price	Extended Price
1	135115	D407-667-205 CROSSTUBE	9/11/2015 Yes 9/11/2015		1.00	\$0.00	\$0.00
To cover the cost of pain stripping. Strip product supplied.							
Line Total:							\$0.00
2	135863	D407-667-205 CROSSTUBE	9/11/2015 Yes 9/11/2015		1.00	\$0.00	\$0.00
To cover the cost of pain stripping. Strip product supplied.							
Line Total:							\$0.00

PO Instructions: PROCUREMENT QUALITY CLAUSES
A000 CLAUSES NOT REQUIRED

Note:

9/8/2015



Manufacturing Inc.

2056 County Rd #4, L'Orignal, Ontario K0b 1K0

Phone 613-675-1208

Fax 613-675-1250

PACKING SLIP

Date : Sept 17 /2015

TO : DART AEROSPACE
1270 Aberdeen Street
Hawkesbury ON
K6A 1K7

SALESPERSON:		JOB #	PO NUMBER :	
		15-0383-22	29714	
QTY ORDER	DESCRIPTION		QTY SHIP	LINE TOTAL
1	Decaper tuyaux (CROSSTUBE) <i>13/9/17 SP</i>		1	

Client: (PRINT NAME) _____ (SIGNATURE) _____

THANK YOU FOR YOUR BUSINESS!

Location	Before dimension	After dimension	Accept	Reject	Method of inspection
----------	------------------	-----------------	--------	--------	----------------------

A	.496	0.505			blade mic <i>ultra</i>
B	2.415	2.431			blade mic
B	.594	0.616			ultra sound
	2.627	2.654			ultra sound <i>BLADE</i>
C	.552	0.551			ultra sound
	2.511	2.534			ultra sound <i>BLADE</i>
D	.650	0.642			blade mic <i>ultra</i>
E	2.749	2.743			blade mic
E	.640	0.619 0.619			ultra sound
	2.739	2.740			ultra sound <i>BLADE</i>
F	.678	0.681 0.681			ultra sound <i>BLADE ULTRA</i>
	2.753	2.733			ultra sound <i>BLADE</i>
G	.575	0.547			blade mic <i>ultra</i>
H	2.590	2.547			blade mic
H	.476	0.460			ultra sound
	2.376	2.369			ultra sound <i>BLADE</i>
I	.517	0.488			ultra sound
	2.495	2.456			ultra sound <i>BLADE</i>

measured by:
date:

inspected by:
date:

25 March

Work Order ID 112867

February-10-14 10:06:46 AM

112867

Page 1

Item ID: D407-667-205

Accept

N900040100

Setup Start *NS1*

Revision ID:

Item Name: Aft Crosstube

Stop *NS2*

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ Date: 14-02-10 Tooling:

Run Start *NR1*

QC: Date: SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
----------	--------------

D407-667-245	Rev F/DEO
--------------	-----------

100

0.00

100

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D407-667-205 CHG008

DAS
31
9-89

1 14-04-30

110

0.00

110

Pick Kit

Packaging

Packaging

Memo

0.00

Packaging

14-04-17

120

0.00

120

BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21

14-04-17

Work Order ID 112867

February-10-14 10:06:46 AM

112867

Page 2

Item ID: D407-667-205

Accept

N9000040100

Setup Start

NS1

Revision ID:

Item Name: Aft Crosstube

Stop

NS2

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

I30

QC15- Crosstube Dimensional Check

0.00

130

QC

Memo

0.00

Quality Control

DAS
03
9-89

DP 14-4-22

Work Order ID 112867

February 10-14 10:06:46 AM

112867

Page 3

Item ID: D407-667-205

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Aft Crosstube

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: Date: Tooling: Date:

Run Start *NR1*

QC: Date: SPC (Y/N): Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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140

0.00

140

Crosstubes

Crosstubes

Crosstubes

Memo

0.00

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: *[Signature]* *****

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes. Holes facing inboard. Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: *[Signature]* *****

2- Drill fwd rivet holes using drill Jig DT8787 fwd as per Dwg D407-667-245.
Note: FWD side has 3X top holes facing inboard.

3- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom hole to prevent accidental drilling. Drill holes and ream using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes. Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: *[Signature]* *****

5-Drill aft rivet holes using drill Jig DT8787 aft as per Dwg D407-667-245.

[Signature]

14-001-23

Work Order ID 112867

February-10-14 10:06:46 AM

112867

Page 4

Item ID: D407-667-205

Accept

N9000040100

Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube

Stop ***NS2***

Start Date: 2/19/14 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Drill only the top (2) holes.

***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING*****
VERIFIED BY: JW *****

6- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

7- Scribe tube to identify on the inner chamfer in the cuff D# and B#

8.*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***Debur
& Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245

150

150

QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

DAS

16

3-85

14/04/23

Memo

0.00

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Handwritten notes and signatures: BL/18, 14-04-23, 14-04-23, 40

Work Order ID 112867

February-10-14 10:06:46 AM

112867

Page 5

Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Aft Crosstube

Stop

NS2

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

0.00

160

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

1- CLEAN CROSSTUBE WITH WASH'N WIPE

1 0 0 AS
14-4-24

180

Outsource process - NDT per QSI038 4.1

0.00

180

Outsource2

Memo

0.00

Outsource process - NDT

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Liquid Penetrant Inspection as per QSI 0380
Issue P/O: 23923 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

CL 14/04/25 ①

190

0.00

190

Packaging

Packaging

Memo

0.00

Packaging

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Ensure copy of NDT results attached to work order.

14/4/25 ①

Work Order ID 112867

112867

Page 6

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Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Aft Crosstube

Stop

NS2

Start Date: 2/10/14

Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

200

QC5- Inspect part completeness to step on W/O

0.00

DAS

27

9-89

200

QC

Memo

0.00

14/1/25

Quality Control

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

204

0.00

204

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE BEFORE CHEMICAL CONVERSION

206

QC7-Inspect Chemical Conversion Coat

0.00

206

QC

Memo

0.00

Quality Control

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

JB/8 14-04-24

1 0 0 12 14-4-25

Work Order ID 112867

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112867

Page 7

Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Aft Crosstube

Stop

NS2

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursTool ID Tool # Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

0.00

210

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Mask underside of crosstube as shown

1-Prime inside and outside crosstube as per DEO D407-667-245 and QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME: 124403

Start Time: 10:00

Finish Time: 10:40

PAINT: 128574

Start Time: 8:00

Finish Time: 9:00

clear 128464

14-4-25

220

QC14- Inspect Spray Paint

0.00

220

QC

Quality Control

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

47 14-04-26 (r)

Work Order ID 112867

February-10-14 10:06:46 AM

112867

Page 8

Item ID: D407-667-205

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube

Stop ***NS2***

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____

Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____

SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230		0.00							
230	Crosstubes								
Crosstubes	Memo	0.00							
Crosstubes	1- Install chafing shield as per DEO D407-667-245. Top holes should be facing up. A/R Proscal 890 Batch: <u>128712</u> EXP: <u>10/14</u>								14-4-29
	2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe								
	3- Install support with Scotch-Weld DP460 and install clamps as per DEO Dwg D407-667-245 using installation jig DT9025. Torque clamps as per dwg A/R Scotch-Weld DP460 Batch: <u>m126005</u> EXP: <u>7/14</u> ***LET CURE FOR 24 HOURS*** CURE TIME: START: <u>2:45</u> FINISH: <u>3:20</u>								
	4- Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.								

Work Order ID 112867

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112867

Page 9

Item ID: D407-667-205

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: Date: Tooling: Date:

Run Start ***NR1***

QC: Date: SPC (Y/N): Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

240

QC5- Inspect part completeness to step on W/O

0.00

240

QC

Memo

0.00

Quality Control

***RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURE FOR
24HOURS AS PER DWG DEO***

250

Pick Kit

0.00

250

Packaging

Memo

0.00

Packaging

260

QC4- 100% Inspect kits for completeness

0.00

260

QC

Memo

0.00

Quality Control

DAS
31
9-89DAS
33 14-04-30
9-89

1 14-04-30

Work Order ID 112867

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112867

Page 10

Item ID: D407-667-205

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube

Stop ***NS2***

Start Date: 2/10/14 Start Qty: 1.00

1

Cust Item ID:

Required Date: 2/24/14 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
270		0.00							
270	Packaging								
Packaging	Memo	0.00		DAS 31 9-89		1		14-04-30	
Packaging	Identify and in kanban rack Location: <u>SHIP</u>								
280	QC21- Final Inspection - Work Order Release	0.00							
280									
QC	Memo	0.00							
Quality Control									

DAS
28
9-89

APR 30 2014

MW 14-04-30

W 14-04-30

Picklist Print

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Page 1

Work Order ID: 112867

112867

Parent Item: D407-667-205

D407-667-205

Parent Item Name: Aft Crosstube

Start Date: 2/10/14

Required Date: 2/24/14

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM
IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
JLM

****CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER****

IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified
by:EC

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev:H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I

10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev:J 11.04.26

removed abrasion strip ecn 11-551 EC verified

by:DD

IPP REV:K

11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	5.0000	1	1			

D407-667-205TRN

Crosstube Turning Detail

**

Location	Loc Qty	Loc Code
LG014	5	
105224	1	
105225	1	
108604	1	
108606	1	
108607	1	
	230	
	Each	
	49.0000	

D2873-043

Manufactured No

D2873-043

Nut Plate Assembly

**

Location	Loc Qty	Loc Code
LG052	49	
104871	17	
107964	20	
110697	12	

B/L 14-04-17
A 14-4-25

Picklist Print

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Page 2

Work Order ID: 112867

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube

112867

D407-667-205

Start Date: 2/10/14

Required Date: 2/24/14

Start Qty: 1.00

Required Qty: 1.00

D2873-045

Manufactured No

230

Each

45.0000

2

2

**

D2873-045

Nut Plate Assembly

112430

Location

Loc Qty

Loc Code

LG052

45

104870

21

108829

24

D2894-1

Manufactured No

230

Each

8.0000

1

1

**

D2894-1

2.75 Support

B113132

Location

Loc Qty

Loc Code

LG052

8

103950

2

105623

6

D3190-1

Manufactured No

230

Each

47.0000

2

2

**

D3190-1

Chaffing Shield

Location

Loc Qty

Loc Code

LG053

47

105834

33

109948

14

~~2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100~~

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Shop Packet Print

Page 2

Picklist Print

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Page 3

Work Order ID: 112867

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube

112867

D407-667-205

Start Date: 2/10/14

Required Date: 2/24/14

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

230 Each

38.7800

2 2

D3595-063-450

Rubber Cushion

**

CR 14-04-27

2

Location

Loc Qty

Loc Code

FG

15

88422

5

94274

10

LG

21.78

108837

21.78

LG051

2

109526

2

MS20601-AD4W8

Purchased

No

230

Each

367.0000

14

14

MS20601-AD4W8

RIVET

**

AR 14-4-25

Location

Loc Qty

Loc Code

ST311

367

M126637

167

M127813

200

MS21920-22

Purchased

No

230

Each

82.0000

4

4

MS21920-22

Clamp

**

CR 14-04-28

4

Location

Loc Qty

Loc Code

LG050

82

M127255

40

M127608

42

128199

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Page 3

Picklist Print

February-10-14 10:06:52 AM

Page 4

Work Order ID: 112867

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube

112867

D407-667-205

Start Date: 2/10/14

Required Date: 2/24/14

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

230

Each

94.0000

2

2

**

MS21920-25

Clamp

CR 14-04-27

Location

Loc Qty

Loc Code

FG

2

120920

2

LG050

92

M127697

17

M127823

25

M128012

50

2

NAS1149D0563J

Purchased

No

230

Each

453.0000

18

18

**

NAS1149D0563J

Washer

DAS
31
9-89

DAS
32
9-89
DAS
33
9-89

Location

Loc Qty

Loc Code

GA

273

m125807

273

ST510a

180

m126319

180

AN5-10A

Purchased

No

250

Each

478.0000

10

10

**

AN5-10A

BOLT

DAS
31
9-89

DAS
33
9-89
DAS
32
9-89

Location

Loc Qty

Loc Code

GA

101

122800

101

ST362

170

M127432

170

st503

207

M126180

207

8x127432

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Shop Packet Print

Page 4

Picklist Print

Page 5

February-10-14 10:06:52 AM

Work Order ID: 112867

Parent Item: D407-667-205

Parent Item Name: Aft Crosstube

112867

D407-667-205

Start Date: 2/10/14

Required Date: 2/24/14

Start Qty: 1.00

Required Qty: 1.00

AN5-32A

Purchased

No

250

Each

222.0000

4

4

DAS

AN5-32A

Bolt

DAS
31
9-89

Location

Loc Qty

Loc Code

ST337

192

124215

188

m127363

4

st503

30

m127550

30

**

128403

DAS
33
9-89

DAS
32
9-89

AN5-34A

Purchased

No

250

Each

64.0000

4

4

DAS
33
9-89

AN5-34A

Bolt

DAS
31
9-89

Location

Loc Qty

Loc Code

ST338

64

m126176

14

m127817

14

m127933

36

**

127933

DAS
32
9-89

MS21042L5

Purchased

No

250

Each

1,033.000

4

4

DAS
33
9-89

MS21042L5

Nut

DAS
31
9-89

Location

Loc Qty

Loc Code

GA

5

117611

5

ST314

28

125535

28

ST509

1000

m127304

500

m127813

500

**

128810

DAS
32
9-89
SVQ

14-04-30

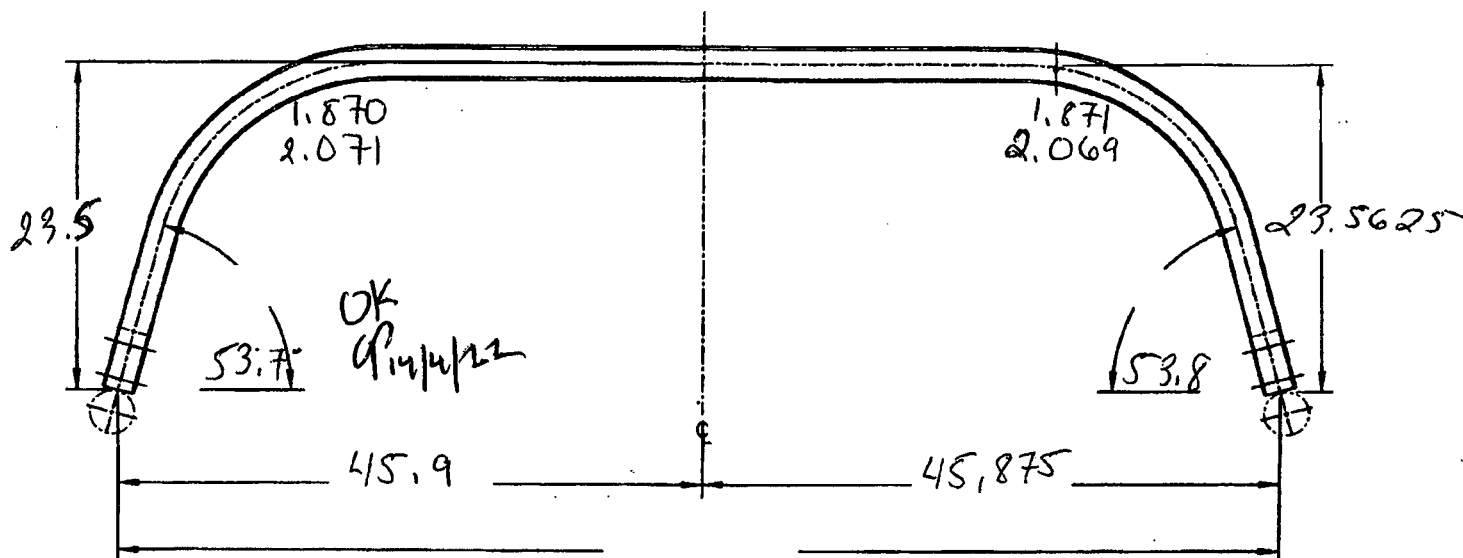
February-10-14 10:06:52 AM

Shop Packet Print

Page 5

DART AEROSPACE LTD	Work Order:	112867
Description: Crosstube High Aft (407)	Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	28	28
Crushing	51	51
Comments		

QC15 Inspection	DAS
Date	03
	9-89
	14-4-22

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	
E	12.04.16	Added bending, crushing dimensions	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

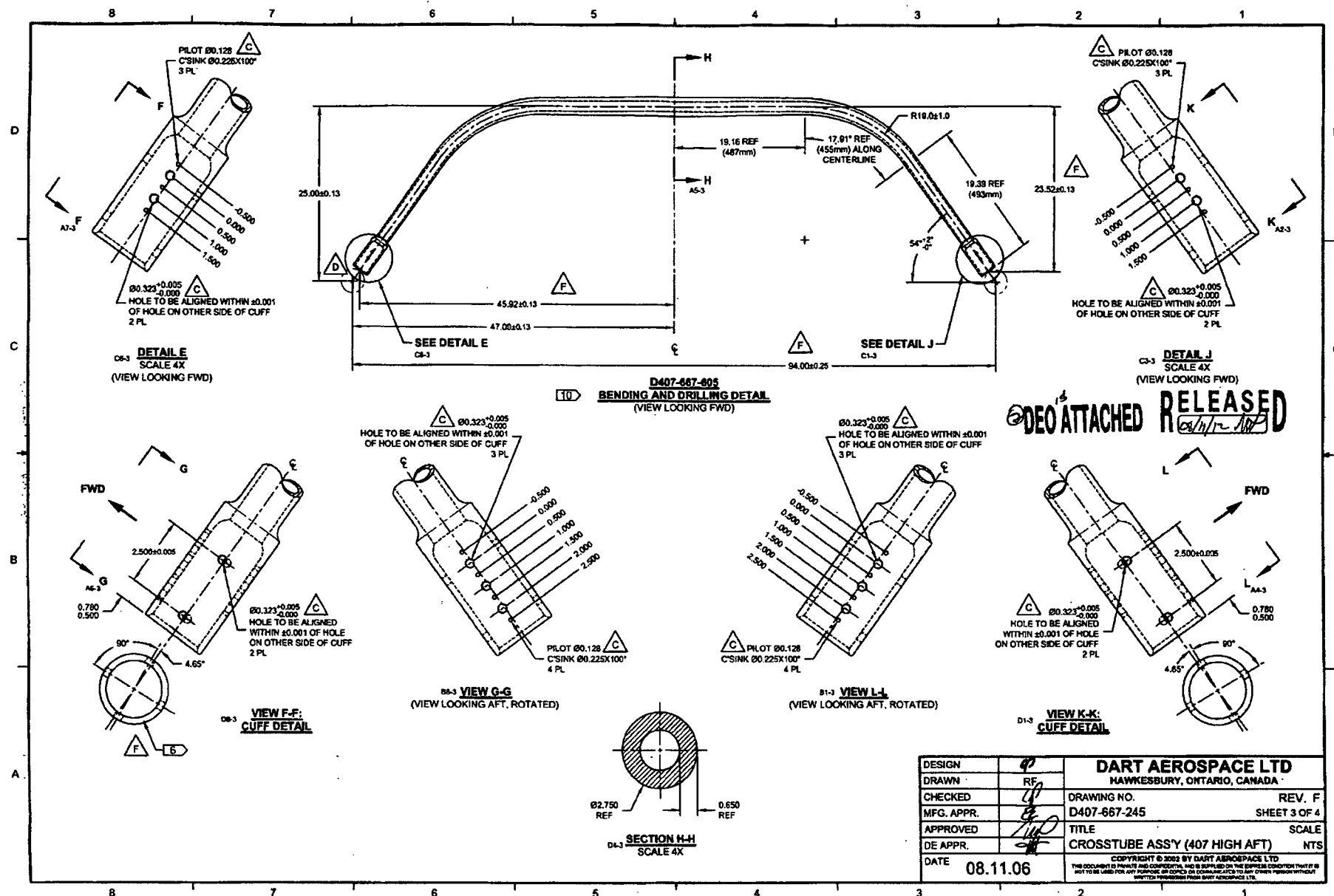
- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 8% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

112867. MWS
1402-10

DEO ATTACHED

RELEASED
08/11/2006

F	REFORMAT NOTES TO NEW STANDARDS (ZN 88-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECH#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES. ROTATE ORIENTATION OF CLAMPS SECTION F-F. REMOVE -451 ABRASION STRIP. ADD MAGNOBOND 6398. ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO.	REV. F
CHECKED	CP	D407-667-245	SHEET 1 OF 4
MFG. APPR.	CP	TITLE	SCALE
APPROVED	CP	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DE APPR.	CP	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS UNCLASSIFIED. IT IS RELEASED ON THE EXPIRATION DATE IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	08.11.06		



NOT ATTACHED RELEASED

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV: F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN <i>h</i>	CHECKED <i>h</i>	MFG. APPR. <i>h</i>	APPROVED <i>h</i>		DE APPR. <i>h</i>		
DATE 11.04.08	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12		DATE 11.04.12		

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty -245	Part Number	Description
3	0	D2856-400-773	ABRASION STRIP

WAS:

3	2	D2856-400-773	ABRASION STRIP
---	---	---------------	----------------

NOTES 2 AND 15, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1
CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
PROSEAL D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT
OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 REF GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.

RELEASED
2011-04-18
h

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WRITTEN PERMISSION FROM DART AEROSPACE LTD.

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>Q</i>	CHECKED <i>AS</i>	MFG. APPR. <i>E</i>	APPROVED <i>MP</i>		DE APPR. <i>#</i>		
DATE 11.09.07	DATE 11.09.13	DATE 11.09.19	DATE 11.09.19		DATE 11.09.19		

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

Item	Qty -245	Part Number	Description
12	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
----	-----	----------------	---

NOTE 12 & 17, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-09-29
MP



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

Page: 1 of 1

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO20028	Customer: Cash Sale	Dept: NDT YUL	Reference: 23923
Descr:	PN: DART AEROSPACE	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN: 0	CSN: 0	TSO: 0	

Task:	Sequence: 0
-------	-------------

Work Required:

CARRY OUT NDT ON THE FOLLOWING CROSSTUBES ID D407-667-205

- 1 WORK ORDER ID 116462
- 2 WORK ORDER ID 112867
- 3 WORK ORDER ID 112863
- 4 WORK ORDER ID 116465
- 5 WORK ORDER ID 116459

Action Taken:	Date:	Initial/Stamp:
---------------	-------	----------------

LIQUID PENETRANT INSPECTION CARRIED OUT
ON AFT CROSSTUBES D407-667-205
IAW ASTM E1417-M13

- | | |
|------------------------------------|-----------|
| 1 W.O. ID 116462 - NO CRACKS FOUND | 24 APR 14 |
| 2 W.O. ID 112867 - NO CRACKS FOUND | 24 APR 14 |
| 3 W.O. ID 112863 - NO CRACKS FOUND | 24 APR 14 |
| 4 W.O. ID 116465 - NO CRACKS FOUND | 24 APR 14 |
| 5 W.O. ID 116459 - NO CRACKS FOUND | 24 APR 14 |

Description	Location	P/N	Qty	Batch	S/N Off	S/N On
PENETRANT	ARDRX 970-P-2SE			TP010484		
BLACK LIGHT	M20189					

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:

Name:

GARY SMITH

ACA/SCA
Stamp



Date:

24 APR
2014

Work Order ID 108607

108607

Page 1

October-23-13 2:50:11 PM

Item ID: D407-667-205TRN

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Turning Detail

Start Date: 10/23/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/06/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ Date: 13-10-23 Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
----------	--------------

D407-667-245	Rev F
--------------	-------

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8531 on both ends as per Folio FA248

2-Turn first side as per Folio FA248

3-Blend transition lines only, **do not sand whole tube**:

FOLIO REV: AA

DWG REV: E

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Memo

0.00

Quality Control

1 φ KC
13-10-26

1 φ KC
13-10-26

October-23-13 2:50:11 PM

Page 2

NS1

NS2

Customer:

*** 1 ***

*** 1 ***

NR1

NR2

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

**Insp.
Stamp**

0.00

MORI SEIKI CNC LATHE LARGE

Memo

0.00

1-Turn second side as per Folio 1A248

2-Blend transition lines only, **do not sand whole tube**:

*Use mill bastard file, brush file repeatedly with file card.

*Do not use sandpaper coarser than 320 grit.

FOLIO REV: *AA*

POLIC REV: 2/10/17
DWG REV: 1

3-Remove sand and plugs

4-Scribe part # and hatch # using vibrating stylus as per Dwg D407-667-245

QC1- Inspect dimensions to dimension sheet

0.00

Memo

0.00

OC

Quality Control

Work Order ID 108607

October-23-13 2:50:11 PM

108607

Page 3

Item ID: D407-667-205TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Turning Detail

Stop ***NS2***

Start Date: 10/23/13 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/06/13 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	QC8- Inspect parts - second check	0.00							
140									
QC	Memo	0.00							ATW 13-10-29
Quality Control									
145		0.00							
145									
Crosstubes	Memo	0.00							ATW 13-10-30
Crosstubes	Grind off circumferential machining marks longitudinally.								
150		0.00							
150									
HandFXtube	Memo	0.00							LB 13-10-30
Hand Finishing Crosstubes	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE								

Work Order ID 108607

October-23-13 2:50:11 PM

108607

Page 4

Item ID: D407-667-205TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Turning Detail

Start Date: 10/23/13 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 11/06/13 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

160 QC5- Inspect part completeness to step on W/O 0.00

160

QC Memo 0.00

Quality Control

DAS
16
9-89 B/10/30

170 0.00

170

Packaging Packaging Memo 0.00

Packaging Identify and stock in kanban rackLocation: 16

JW 13-10-31

180 QC21- Final Inspection - Work Order Release 0.00

180

QC Memo 0.00

Quality Control

MLJ 13-11-07

B/10-31

Picklist Print

October-23-13 2:50:15 PM

Page 1

Work Order ID: 108607

108607

Parent Item: D407-667-205TRN

D407-667-205TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 10/23/13

Required Date: 11/06/13

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
IPP Rev B 08.04.02 Removed polish EC verified by: DD
IPP Rev:C 08-08-19 revE as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D6011-115

Manufactured No

120

Each

30.0000

1

1

D6011-115

**

Crosstube Material

Location

Loc Qty

Loc Code

LG015

30

67798

10

69802

3

75639

17

1

mm.l
13/10/24

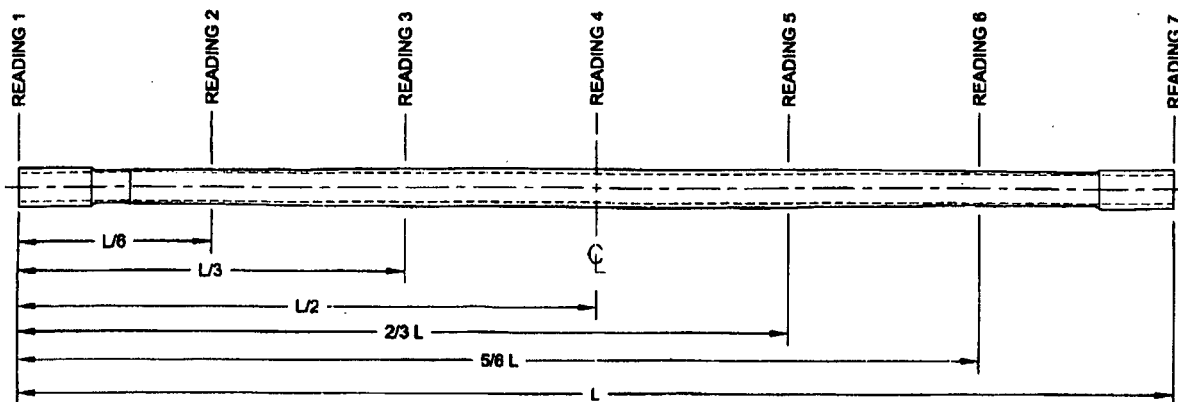
DART AEROSPACE LTD	Work Order:	<i>108607</i>
Description: Crosstube Assembly	Part Number:	D407-667-245
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	<i>2.492</i>	/		VERN	CNC-08
	1.832	+0.005/-0.000	<i>1.836</i>	/			
	1.838	+0.005/-0.000	<i>1.843</i>	/			
	1.892	+0.005/-0.000	<i>1.896</i>	/			
	2.052	+0.005/-0.000	<i>2.056</i>	/			
	2.206	+0.005/-0.000	<i>2.210</i>	/			
	2.521	+0.005/-0.000	<i>2.525</i>	/			
	2.633	+0.005/-0.000	<i>2.634</i>	/			
	4.10	+/-0.030	<i>4.10</i>	/			
	4.978	+/-0.030	<i>4.990</i>	/			
	2.040	+0.000/-0.010	<i>2.034</i>	/			
	0.125	+/-0.010	<i>.125</i>	/			
	R0.063	+/-0.010	<i>.063</i>	/		R6	
	R0.500	+/-0.010	<i>.500</i>	/		R6	
SIDE B	2.490	+0.005/-0.000	<i>2.493</i>	/			
	1.832	+0.005/-0.000	<i>1.837</i>	/			
	1.838	+0.005/-0.000	<i>1.843</i>	/			
	1.892	+0.005/-0.000	<i>1.896</i>	/			
	2.052	+0.005/-0.000	<i>2.056</i>	/			
	2.206	+0.005/-0.000	<i>2.209</i>	/			
	2.521	+0.005/-0.000	<i>2.525</i>	/			
	2.633	+0.005/-0.000	<i>2.636</i>	/			
	4.10	+/-0.030	<i>4.10</i>	/			
	4.978	+/-0.030	<i>4.986</i>	/			
	2.040	+0.000/-0.010	<i>2.034</i>	/			
	0.125	+/-0.010	<i>.125</i>	/			
	R0.063	+/-0.010	<i>.063</i>	/		R6	
	R0.500	+/-0.010	<i>.500</i>	/		R6	
	112.91	+/-0.020	<i>112.93</i>	/		TAPE	LG-25

DART AEROSPACE LTD	Work Order: <u>108607</u>
Description: Crosstube Assembly	Part Number: <u>D407-667-245</u>
Inspection Dwg: D407-667-245 Rev: F	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.233	.235	.228	.233	.007	0.075"
READING 2 L= 18.8	.237	.248	.256	.241	.019	
READING 3 L= 37.6	.410	.410	.421	.421	.011	
READING 4 L= 56.4	.642	.657	.662	.648	.020	
READING 5 L= 75.2	.420	.413	.410	.420	.010	
READING 6 L= 94.0	.258	.249	.238	.251	.020	
READING 7 L= 112.91	.234	.232	.231	.232	.003	

Top	Bottom
0.419	0.461
0.639	0.687
0.419	0.414

Calibration Result

Actual Block Thickness: 100-750

SITESCAN 250 Measured Thickness: 100-750

Measured by: <u>KC</u>	Audited by: <u>JW</u>	Preliminary Approval:
Date: <u>13-10-27</u>	Date: <u>13-10-29</u>	Date:

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-205)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	06.03.30	Tolerance revised for 4.978 dimension	KJ/JLM	
D	07.02.19	Dwg Rev updated	KJ/JLM	
E	09.05.20	Dwg Rev updated	KJ	
F	12.06.04	Wall thickness form added	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

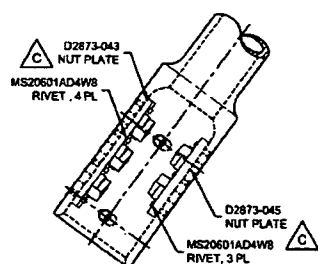
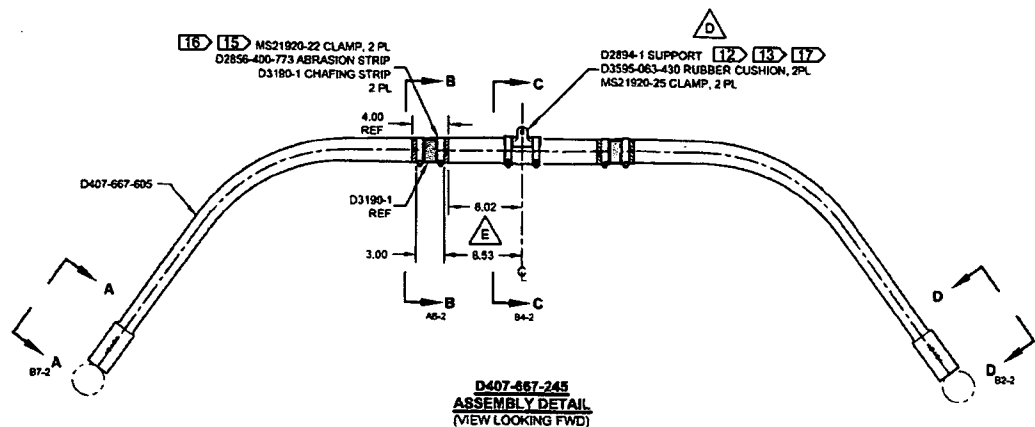
108607 MJS
13-10-23

@DEO ATTACHED

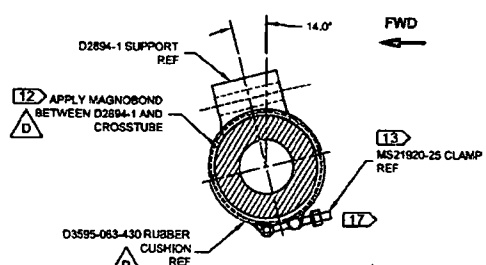
RELEASED
08/11/2006

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECR#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO.	REV. F
CHECKED	RF	D407-667-245	SHEET 1 OF 4
MFG. APPR.	RF	TITLE	SCALE
APPROVED	RF	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DE APPR.	RF	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT NOT TO BE USED FOR ANY PURPOSES OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	08.11.06		

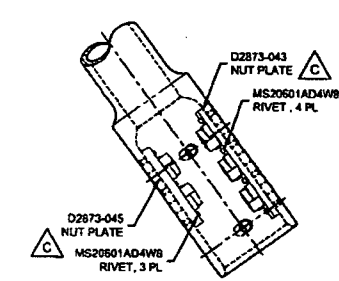
108607



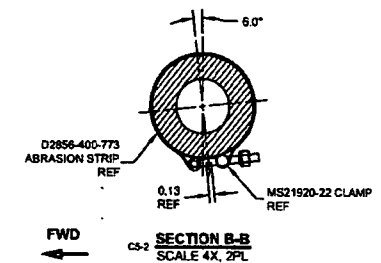
VIEW A-A CUFF DETAIL
SCALE 4X



SECTION C-C
SCALE 4X



VIEW D-D CUFF DETAIL
SCALE 4X

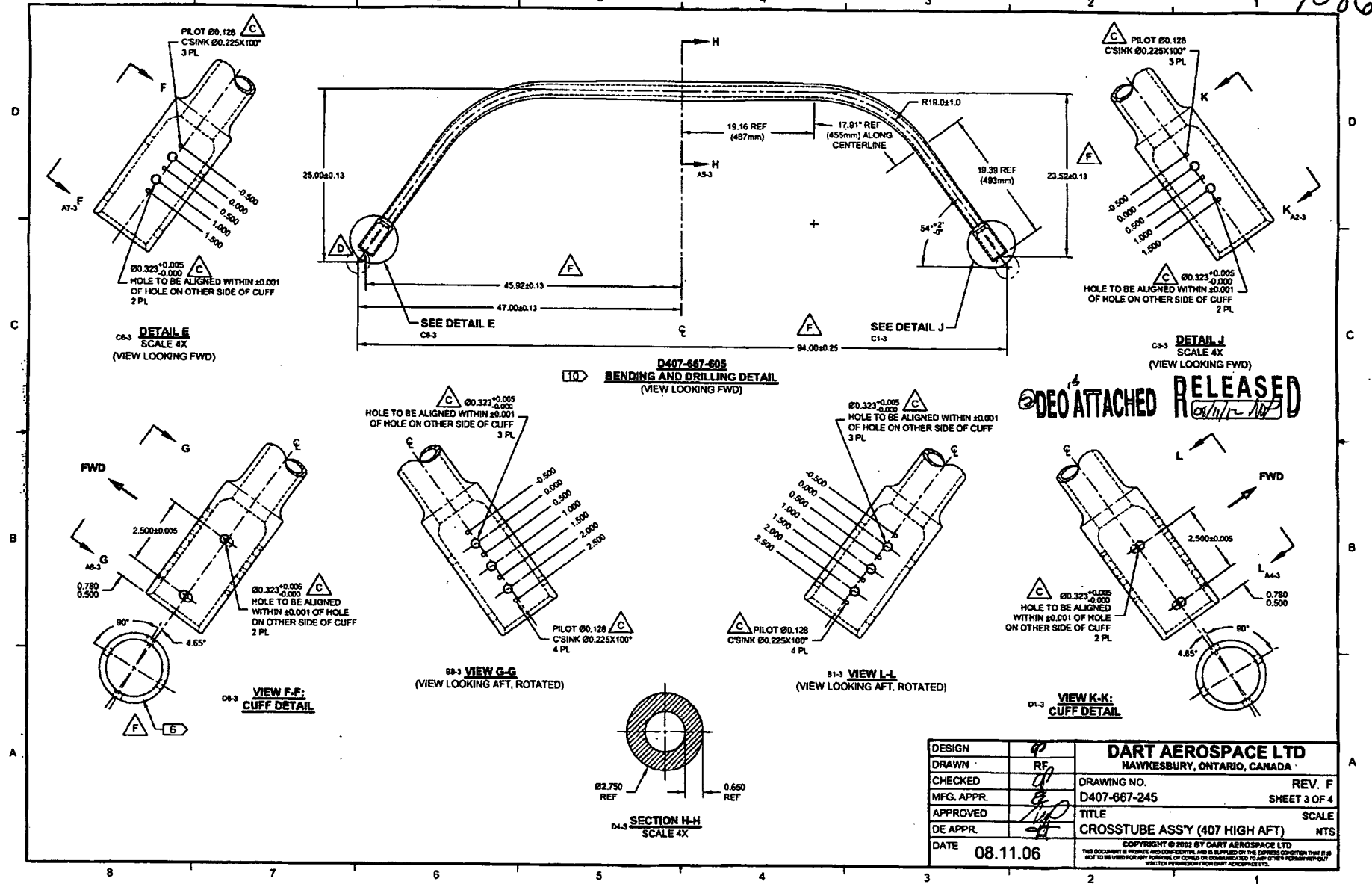


SECTION B-B
SCALE 4X, 2PL

DEO ATTACHED
RELEASED
08/11/06

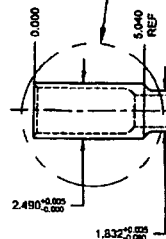
DESIGN	40	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	40	DRAWING NO.	REV. F
MFG. APPR.	40	D407-667-245	SHEET 2 OF 4
APPROVED	40	TITLE	SCALE
DE APPR.	40	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2003 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

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108607

SEE DETAIL M
A7-4



R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

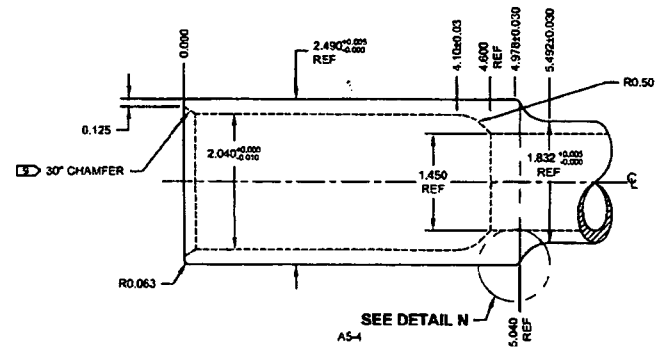
R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

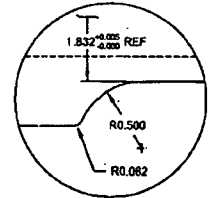
SEE DETAIL P
A2-4

TAPER UNIFORMLY FROM
2.633 +0.005/-0.000 REF THROUGH TO 2.790 +0.005/-0.000 REF
RUNNING OFF PART

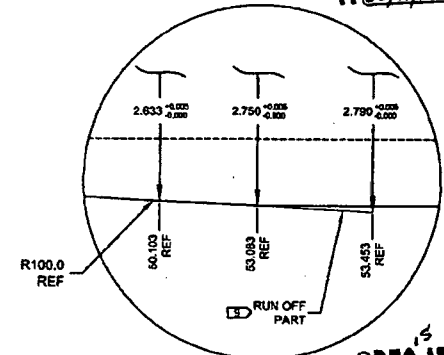
D407-667-245 MACHINING DETAIL



SEE DETAIL N
A5-4



**DETAIL N: CUFF TRANSITION
SCALE 2X**



**DETAIL P: TAPER RUN-OFF
NOT TO SCALE**

RELEASED
08/11/06

DEO ATTACHED

DESIGN	08	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	4P	DRAWING NO.	REV. F
MFG. APPR.	4P	D407-667-245	SHEET 4 OF 4
APPROVED	4P	TITLE	SCALE
DE APPR.	4P	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2003 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

108607

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.08	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12			

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty -245	Part Number	Description
3	0	D2856-400-773	ABRASION STRIP

WAS:

3	2	D2856-400-773	ABRASION STRIP
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NOTES 2 AND 15, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1
CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT
OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 REF GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.

RELEASED
2011-04-18

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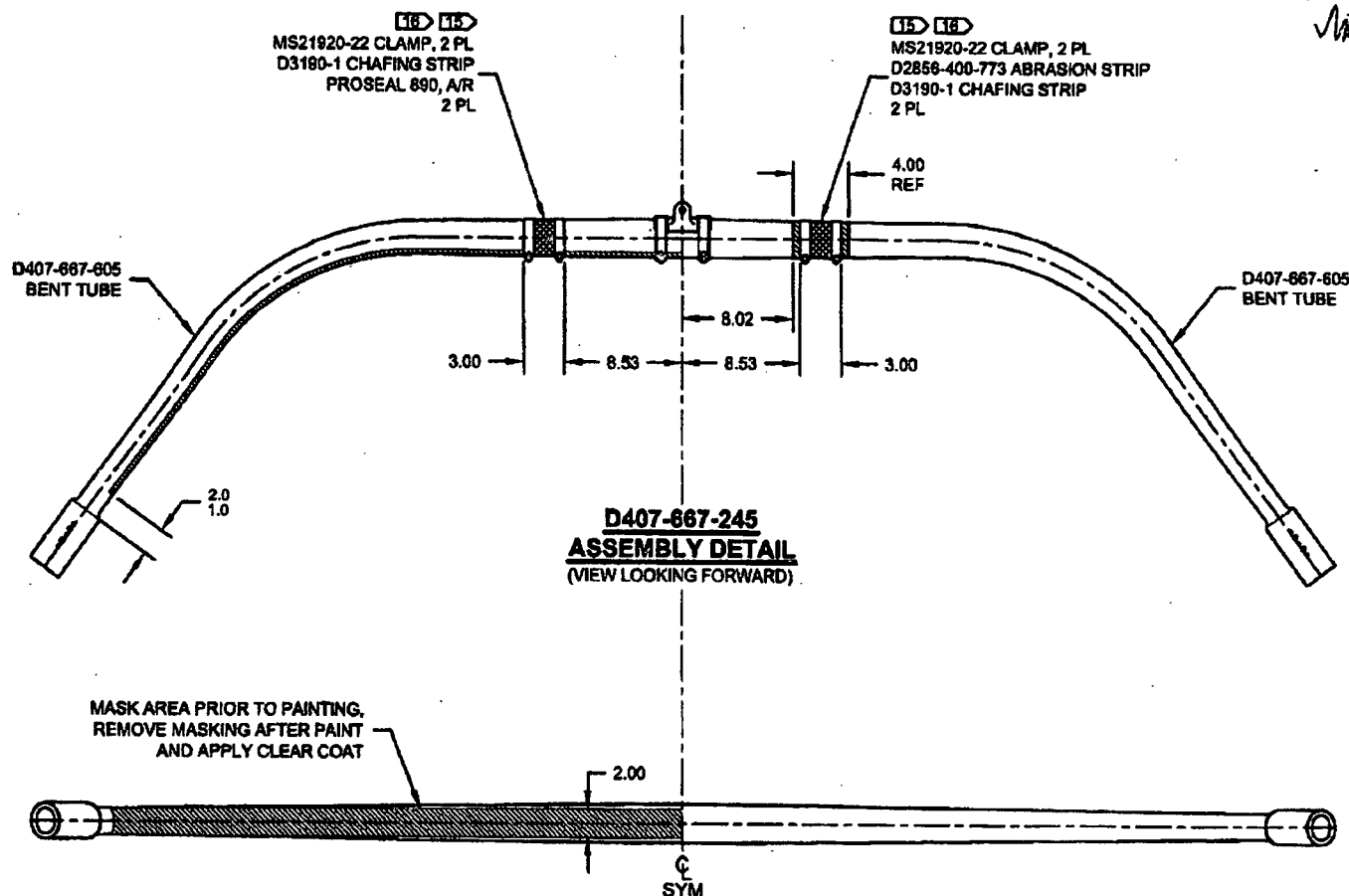
108607

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F.1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.		
DATE 11.04.08	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12		

IS:

WAS:

RELEASE
2011-04-10



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108603

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 97	CHECKED AS	MFG. APPR. E	APPROVED MP	DE APPR. TH			
DATE 11.09.07	DATE 11.09.19	DATE 11.09.19	DATE 11.09.19	DATE 11.09.19			

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

Item	Qty	Part Number	Description
	-245		
12	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 17, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-09-29
MP

QA Closed: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



Work Order update only

Work Order update only					
Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐		
Date : 15/10/17		Step #:	QTY Effective :		
Description Work Order Deviation Acceptable to put a bead of process 890 around support and chafing shield.		Disposition Acceptable, minor deviation			
				MRB (QSI042) Approval	
				DAS 12 15/10/17 9-89	
				Completed By	
		Lead hand / Supervisor Approval Verification			
		QC / QA Coordinator Approval			
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER :					